CANINE DEMODICOSIS AND ITS HERBAL AND NON-HERBAL TREATMENTS

S. Chakraborty and N.R. Pradhan
Department of Veterinary Medicine, Ethics & Jurisprudence, Faculty of Veterinary & Animal Sciences, West Bengal University of Animal & Fishery Sciences, Kolkata-700037.
[Received: 04.5.2015; Accepted: 05.11.2015]

Dermatological disorders are commonly encountered in dogs at different ages. It has a very harmful effect on the general health, utility and cosmetic values in canine (Chatterjee, 2007). Demodicosis is one of the most common factor causing dermatitis in them and require effective treatment. Some herbal and non-herbal medicines are available which claim their effectiveness in control of this disease condition. Hence a trial for effective treatment of demodicosis in dogs was taken in this study.

Materials & Methods

For this study, dogs brought to the Dog ward of West Bengal University of Animal and Fishery Sciences, Kolkata and some private Pet Clinics in and around Kolkata metropolis with skin lesions were selected. The dogs which were suspected naturally infected with Demodex canis and having generalised and localised lesions were selected and their deep skin scrapings were collected and thereafter examined directly and by sedimentation method with 10% KOH solution.

Their age, sex, breed & site of lesions etc. were recorded. The blood samples from the positive D. canis infected cases were collected for haematological and blood protein analysis by standard techniques.

Courses of antibiotic therapy based on the antibiotic sensitivity test and an antihistamin were given orally daily for 10 days to each dog before the actual treatment protocol for demodicosis.

For treatment, 18 clinical cases with localised and generalised demodectic mange infections were selected and divided in 3 groups (Gr. II, III & IV) comprising 6 in each. Drugs were applied to them until the dogs showed the clinical improvements. The Gr. II dogs were treated with Ivermectin injection @ 1ml/20 kg body wt. S/C at 7 days intervals for 4 occasions. The Gr-III dogs were also given Ivermectin injection at the some dose rate. Besides these dogs were given bath with Benzoyl Peroxide (2.5%) shampoo and there after Amitraj (12.5%) was applied topically @ 3 ml/litre of water for 5 to 6 occasions. The Gr. IV dogs were treated with the herbal medicines. They were given Teeburb capsule 4 @ 1-2 caps twice daily orally for 30 days according to the body weight and severity of infections and local application of Skin Heal spray on the lesions twice daily for 20-30 days.

Another 6 healthy dogs were selected and was considered as healthy control or Gr.I. Assessments of the efficacy of the drugs were considered based on the skin scrapings, clinical improvements, haematological and blood biochemical changes.

Results and Discussion

Out of 1480 dogs examined, 161(10.88%) dogs had the skin lesions and 45(3.04) cases were positive for demodicosis and it corroborate with the findings of Chakraborty and Pradhan (1985) in dogs. The incidence was found highest during the month of July and the female dogs were noted to suffer more than the male dogs which simulated with the observations of Chatterjee (2007). The incidences of D. canis infection were noted higher in the Labrador dogs than in other breeds of dogs and in age group highest incidence was recorded in 0-6 months of
age than in other age groups as also observed by Nayak et al. (1997).

In the present study, the skin disorders were described as localized loss of hair (alopecia), erythema, papules, pyoderma, scale, crust or excoriation, seborrhoea, pruritus, rough body coat with unpleasant or mousy odour etc. These lesions were mostly observed on the nostrils, foreheads forelegs, eyes (periorbital), back, hind legs and on tail etc, and simulated with the findings of Chakraborty and Pradhan (1985) and Muller et al. (1989) in dogs.

After the treatment in Gr.II dogs with Ivermectin injection, the animals showed gradual improvements of the skin lesions.

The Gr.III dogs receiving Ivermectin injection, Benzoyl Peroxide shampoo and Amitraj lotion, showed much better clinical improvements of skin disorders. The pruritus decreased markedly, skin lesions gradually disappeared and there was resurgence of hairs in the alopecic areas. Soclam et al. (1997) opined that the use of ivermectin alone is 50% effective against demodicosis but 100% effective when used in combination with amitraj lotion locally.

On the other hand, the Gr.IV dogs received the herbal treatments with Teeburb capsule orally and Skin Heal spray locally showed good improvements of the clinical sings. Supekar and Misraulia (1988) opined Teeburb when used for 20 days causes fast reduction in mite numbers and an improvement of the clinical signs in demodectic dogs. Kirtikar and Basu (1996) opined *Eucalyptus globules*, one ingredient of Skin Heal spray acts as an antiseptic agent while Jain (1996) remarked *Pinus longifolia*, the other ingredient is useful in the skin diseases. Therefore these herbal medicines helped in improvement of the clinical signs in demodectic dogs.

The results of the haematological changes have been presented in Table-1. It revealed from the table that the haemoglobin and total erythrocytic levels declined significantly (p<0.01) from the healthy dogs as also recorded by Roy et al. (1991) and Chatterjee (2007) and it might be due to reduced appetite, loss of blood during scratching and also loss of protein as mentioned by Schalm et al. (1986) and Muller et al. (1989) also. But following treatment in Gr.II and III, the values improved significantly (P<0.01) after 45 days. Aujla et al (2000) opined ivermectin can control the population of mites in the skin & can cause reduction in loss of blood & protein. Mukhopadhyay (1999) and Roy et al. (2000) also observed the significant (P<0.01) improvements of Hb & TEC values following treatment of demodectic dogs with amitraj and ivermectin.

Improved Hb and TEC levels with herbal therapy in demodectic dogs was also noted by Chatterjee (2007).

The mean total leucocytic count of the demodectic dogs was significantly higher (P<0.01) than the healthy dogs and might be due to pyoderma which is generally associated with demodicosis in dogs as also reported by Nesbitt (1983), but following treatment in these three groups, the values declined indicating the usefulness of antibiotic, Alincomycin in proper doses given in these groups along with other therapies. Besides in Gr.IV, the herbal medicines used had the antimicrobial effects on the skin. Das and Roy (1994) opined Teeburb has an antimicrobial action against the wound and an anti-inflammatory effect in the inflamed skin. Kirtikar and Basu (1996) opined, *Eucalyptus globulus*, one ingredient of Skin Heal spray is an effective antiseptic agent while Jain (1996) also remarked that it can inhibit the growth of *Staphylococcus albus, Staphylococcus aureus* and *E. Coli*, the common infections of the skin. The other ingredients of Skin Heal spray like *Pinus longifolia*, is very useful in the skin diseases also mentioned by Jain (1996) and *Cedrus deodara* is also very useful in skin inflammations and skin disorders. Thus these herbal therapies effectively helped in reducing the TLC values in Gr. IV.

This study also showed that there was significant (P<0.01) increase of the neutrophil and decrease of the lymphocyte percentages in the demodectic dogs in
comparison to the healthy control dogs of Gr. I and simulated with the findings of Burkett et al. (1996) and Toman et al. (1997). They noted neutrophilia and lymphopenia as a constant feature in *D. canis* infected dogs with concurrent pyoderma. Lymphopenia in demodicosis could be due to T-cell suppression resulting from certain blastogenesis suppressing factors present in the sera of demodicosis dogs as also reported by Scott et al. (1974).

Following therapy in Gr-II and in Gr-III, the neutrophil and lymphocyte percentages almost became normal indicating the usefulness of these drugs in *D. canis* infections. Changes of these values were also noted in Gr-IV dogs with herbal therapy and simulated with the findings of Chatterjee (2007).

There was significant (P<0.01) increase of the eosinophil percentage in the demodectic dogs than the healthy dogs and it might be due to irritation of the skin tissues with *D. canis* infection which stimulated the mast cells for release of more histamine. Since the histamine is chemotactic for eosinophils, eosinophilia develops similar findings were of Aujla et al. (2000). Significant (P<0.01) declinations following treatment in these groups indicated the usefulness of these herbal and non-herbal treatments in these demodectic mange infected dogs.

The Table-1 also showed a non-significant declination of the total serum protein value in the infected dogs in comparison to the healthy dogs and simulated with findings of Dimri (1995) and is might be due to loss of protein from the skin as remarked by Muller et al. (1989). Following treatment with Ivermectin in Gr-II and Ivermectin, Amitraj and Benzoyl Peroxide in Gr-III, these values became normal at the end of the experiment indicating decrease of further protein loss. The herbal therapy given in Gr-IV also could alleviate the irritation of the skin due to *D. canis* infection and brought the total protein level normal.

**Table 1. The mean haematological and serum protein changes in Demodectic dogs before and after treatment.**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Healthy control (n=6) (Gr. – I)</th>
<th>Before treatment (n=18)</th>
<th>After 45 days and with treatment for 30 days</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Gr. – II (n=6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12.10 ± 0.188**</td>
</tr>
<tr>
<td>Haemoglobin(gm/dl)</td>
<td>12.75 ± 0.341</td>
<td>9.25 ± 0.228**</td>
<td>12.19 ± 0.315**</td>
</tr>
<tr>
<td>TEC (10^6/cmm)</td>
<td>6.01 ± 0.198</td>
<td>3.85 ± 0.405**</td>
<td>5.64 ± 0.136**</td>
</tr>
<tr>
<td>TLC (10^3/cmm)</td>
<td>7.99 ± 0.129</td>
<td>11.26 ± 0.114**</td>
<td>10.46 ± 0.318**</td>
</tr>
<tr>
<td>Neutrophil (%)</td>
<td>62.67 ± 0.257</td>
<td>72.56 ± 0.382**</td>
<td>68.36 ± 0.298**</td>
</tr>
<tr>
<td>Lymphocyte (%)</td>
<td>25.56 ± 0.244</td>
<td>16.28 ± 0.182**</td>
<td>23.36 ± 0.418**</td>
</tr>
<tr>
<td>Eosinophil (%)</td>
<td>5.21 ± 0.315</td>
<td>8.12 ± 0.516**</td>
<td>5.11 ± 0.078**</td>
</tr>
<tr>
<td>Serum total Protein (gm/dl)</td>
<td>6.82 ± 0.324</td>
<td>6.46 ± 0.213</td>
<td>6.71 ± 0.324</td>
</tr>
<tr>
<td>Serum Albumin (gm/dl)</td>
<td>3.18 ± 0.115</td>
<td>2.44 ± 0.312**</td>
<td>3.08 ± 0.345**</td>
</tr>
<tr>
<td>Serum Globulin (gm/dl)</td>
<td>3.64 ± 0.286</td>
<td>4.02 ± 0.312</td>
<td>3.63 ± 0.116</td>
</tr>
</tbody>
</table>

** Significant at 1% level (P<0.01) in comparison to healthy control group.

** Significant at 1% level (P<0.01) in comparison to before treatment values.

A significant (P<0.01) hypoalbuminemia was also noted in the demodectic dogs, simulating with the findings of Gupta et al. (2001) but became normal at the end of the experiment in all the groups.

The serum globulin level (Table-1) slightly elevated in the demodectic dogs in comparison to the healthy dogs and confirmed the findings of Gupta et al. (2001) and Sarkar (2002), but following treatment in all the groups, the values
became normal at the end of the experiment.

The efficacies of the drugs used in these 3 groups were also evaluated by the detection of mites through skin scrapings examination and the results have been presented in Table-2.

Table 2. Number and percentages of dogs harbouring or cleared of D.canis mites before and different days after treatment in different Groups.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Treatment given</th>
<th>Skin scrapings</th>
<th>Days after treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Dogs +ve Dogs -ve</td>
<td>0 day 10th 15th 20th 25th 30th 45th</td>
</tr>
<tr>
<td>II</td>
<td>Mectin</td>
<td></td>
<td>6 0 0 0 0 1 16.67</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Percentage of ve findings</td>
<td>6 0 0 0 0 4 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 3 3 3 3</td>
</tr>
<tr>
<td>III</td>
<td>Mectin+ Ridd+ Petben shampoo</td>
<td>Dogs +ve Dogs -ve</td>
<td>6 0 0 6 5 4 2 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Percentage of ve findings</td>
<td>0 0 0 0 16.67 33.33 66.67 100</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0 4 6 6</td>
</tr>
<tr>
<td>IV</td>
<td>Teeburb + SkinHeal</td>
<td>Dogs +ve Dogs -ve</td>
<td>6 0 0 6 6 5 3 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Percentage of ve findings</td>
<td>0 0 0 0 0 1 3 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0 16.67 50</td>
</tr>
</tbody>
</table>

It is evident from the table that, in Gr-II with treatment of Ivermectin injection, out of 6 dogs, 3 dogs (50% efficacy) were found negative for mite infection on 45th day and simulated with the findings of Soclam et al. (1997) and Pradhan, et al. (2012). In Gr-III, with treatment of Ivermectin, Benzoyl Peroxide and Amitraj all the 6 infected dogs were found free from the mite infection (100% efficacy) on 45th day and this higher efficacy is attributable due to the use of Amitraj which could act directly on the mites due to adequate penetration of the same through supportive therapy of Petben shampoo containing Benzoyl Peroxide and this findings confirmed the observations of Gatne et al. (1992) and Pradhan et al. (2012) in the demodicetic dogs.

In Gr-IV with herbal therapy, 3 dogs (50%) out of 6 dogs showed negative for mite infection on 45th day indicating the combined effects of oral Teeburb capsule and local application of Skin Heal spray.

Teeburb contains Cedrus deodara, Curcuma longa, Berberis aristata and Pueraria tuberoso. Kirtikar and Basu (1996) opined C. Deodara has an anti-inflammatory effect on the skin disorders and C. Longa is very useful in scabies and other cutaneous parasitic affections. Shukla (1995) studied the toxicological effect of P. tuberoso in mites and recorded its anti fertility property. Therefore these herbal ingredients have inhibited the reproduction of the mites, stopped the development of eggs and thus have helped in reduction of the population of mites on the skin of dogs of Gr-IV.

Therefore, this above findings indicates that Ivermectin alone is useful but highly effective when used with Benzoyl Peroxide shampoo and Amitraj lotion in treatment of demodectic dogs. The herbal drugs like Teeburb orally and Skin Heal spray locally were also found useful in the treatment of demodicosis in dogs.

References


